Two new cryptic species of *Menodora* (Oleaceae) from southern Coahuila, Mexico

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ABSTRACT

Two novel cryptic taxa of *Menodora* are described from southern Coahuila, Mexico: **M. chumleyi** B.L. Turner, **sp. nov.,** and **M. geohintonii** B.L. Turner, **sp. nov.**; the former relates to *M. coulteri*, the latter to *M. helianthemoides*. Both of the novel taxa belong to a DNA clade having pubescent stylar shafts, the only plants in the genus known to possess such pubescence, except for an anomalous plant of *M. muellerae*. Maps showing the distributions of the several taxa are provided, along with photographs of *M. geohintonii* growing in the field. Published on-line **www.phytologia.org** *Phytologia 96(1): 33- 40 (Jan. 8, 2014).* ISSN 030319430

KEY WORDS: Oleaceae, *Menodora*, Mexico, Coahuila, *M. coulteri*, *M. helianthemoides*.

MENODORA CHUMLEYI B.L. Turner, **sp. nov. Fig. 1**
Resembling **M. coulteri** but a taller, more intricately branched plant having much larger corollas and pubescent stylar shafts.

Suffruticose herbs or intricately branched **shrublets** to 30 cm high. **Stems**, lowermost, markedly woody, up to 1.5 mm across; mid-stems 1.5-4.0 mm across, pubescent with minute, downwardly directed hairs 0.1-0.2 mm long. **Leaves** linear-lanceolate, 10-25 mm long, 2-3 mm wide, minutely ciliate along the margins, if at all, their apices acute. **Flowers** reflexed with age. **Calyces** 7-10 mm long, having ca 12 ciliate, linear, lobes 6-8 mm long. **Corollas** yellow, glabrous, except for the throat of the tube; tubes ca 3 mm long; lobes 10-14 mm long, 3-5 mm wide. **Stamens** exserted for 10-14 mm, the filaments sparsely pubescent; anthers ca 2 mm long. **Styles** exserted for 10-12 mm, the shafts decidedly pubescent. **Fruiting pedicels** 8-10 mm long, recurved. **Capsules** circumscissile, 4-5 mm high, and as wide, glabrous; seeds 1/locule, obovate, ca 4 mm long, 2 mm wide, the surfaces smooth and shiny.

TYPE: **MEXICO. COAHUILA: Mpio. Arteaga**, Sierra Zapaliname, 2505 m, "Bushy limestone hillside." 22 Jun 1992, *G.B. Hinton et al. 22066* (Holotype : TEX).

ADDITIONAL SPECIMENS EXAMINED: **MEXICO. COAHUILA: Mpio. Arteaga**, Sierra Zapaliname, 2430 m, 19 May 1990, *Hinton* et al. *20240* (TEX). **Mpio. Saltillo**, ca 6 km W of Saltillo, "E. extremity of the Sierra de la Vega, at and below Estacion Microondas La Vega," 25 25 N, 101 05 W, 1800-2000 m, 30 Mar 1973, *Johnston, Wendt & Chiang 10501* (LL); ca 11 mi W of Saltillo, "near Est. Vega microwave tower," 27 Sep 1974, *Rollins & Rollins 7467* (TEX).

Early on, I identified all of the above sheets as **M. coulteri**, which they indeed resemble. Closer inspection and the DNA studies by Chumley, along with the detection of hairs on stylar shafts, have led to the cryptic species proposed here. Interestingly, *Johnston* et al. *10501* (LL) was designated as the holotype of Chumley's intended *M. henricksonii*, this not annotated as such at TEX, hence my ignorance of Chumley's eponym and my selection of a different holotype.

The distribution of **M. chumleyi** and its closest morphological cohort, **M. coulteri**, is shown in **Map 1**.

MENODORA GEOHINTONII B.L. Turner, **sp. nov. Fig. 2**

Resembling **M. helianthemoides** but the stem pubescence more nearly pilose (vs minutely hispid), the leaves smaller, flowers larger, and stylar shafts pubescent.

Suffruticose herbs or dwarf subshrubs 5-20 cm high. **Stems** (lower) decidedly woody, 3-4 mm across, at mid-stem decidedly pubescent with spreading hairs 0.3-0.5 mm long. **Leaves opposite**, 8-12 mm long, 2.5-4.0 mm wide; petioles 1-2 mm long; blades linear-elliptic to linear-oblanceolate, uninervate, grading into the blades, pubescent along the margins like the stems. **Flowers** reflexed with age. **Calyces** 6-7 mm long having 12-14, markedly ciliate, linear lobes 7-8 mm long. **Corollas** yellow, glabrous except for the corolla throat; tubes ca 3 mm long; lobes 10-12 mm long, 5-6 mm wide. **Stamens** exserted for 5-7 mm, the filaments sparsely pubescent; anthers yellow, ca 2 mm long. **Styles** exserted for 8-10 mm, the shafts decidedly pubescent with short stiff hairs, the stigmoid surfaces orbicular, ca 0.5 mm across. **Fruiting pedicels** 4-6 mm long, recurved. **Capsules** 4-5 mm high, and as wide, glabrous; seeds (immature), seemingly tuberculate.

TYPE: **MEXICO. COAHUILA: Mpio. Ramos Arizpe**, Sierra San Jose de los Nuncios, "Limestone rockslide." 1375 m, *G.B. Hinton* et al. *21048* (Holotype: TEX).

In my overview of North American **Menodora** (Turner 1995), I placed the above type specimen into my concept, at the time, of *M. magniflora* (Steyerm.) B.L. Turner, this treated as a variety of **H. helianthemoides** by Steyermark (1932), who distinguished it from the latter by its inconspicuous, "short or closely appressed hairs," and larger corollas (14-17 mm long vs 9-14 mm). I did, however, call attention to its resemblance to **M. tehuacana** B.L. Turner, but failed, at the time, to note its pubescent stylar shafts. Chumley (2007) placed the type of *H. magniflora* in synonymy with **M. helianthemoides** proper, which I now follow; he subsequently examined DNA of the *Hinton 21048* collection, annotating this with the following cryptic notation "Menodora helianthemoides Bonpl. in morphology…Galeana cryptoclade molecularly…" The "Galeana clade" presumably consists of **M. gypsophila** and **M. muellerae**.

At the time of Chumley's research, I called his attention to the anomalous, geographically remote, type specimen and suggested I might anoint the plant as **M. chumleyi**, if additional collections came to light. Regardless, my reexamination of the type concerned revealed several novel features that distinguished the plant from **M. helianthemoides**, including corolla size, stem pubescence and that of the stylar shaft, which possessed stiff short hairs, as does **M. chumleyi**, described above, the latter consisting of 4 specimens all annotated by Chumley as **M. coulteri** morphologically but molecularly belonging to the Galeana cryptic clade. I take both **M. chumleyi** and **M. geohintonii** to be cryptic species belonging to the Galeana clade, as noted by Chumley. Interestingly, all of the plants concerned possess pubescent stylar shafts, to my knowledge the only such plants within **Menodora** to have this feature (with the exception of a single sheet of **M. muellerae** [*Hinton* et al. *25349*] that possessed only 1 or 2 hairs on its stylar shafts).

I have not examined the type of *Menodora henricksonii* var. confusa, but I assume that Chumley's type is correctly positioned. However, typical plants of **C. coulteri** occur in the vicinity of Parras, Coahuila (e.g. *Cowan 3623*, TEX), the latter plant w/o corollas, but possessing the stem pubescence of **M. coulteri**, this not similar to that of the larger flowered plant having longer spreading hairs (*Hinton 21048*) that characterize my **M. geohintonii**. In short, it is possible that the type of *M. h.* var. *confusa* represents yet another cryptic species having smaller flowers, shorter stem hairs as well as pubescent stylar shafts, these confined to the vicinity of Parras, the latter an area known for its local endemics.

Finally, I should note that I informed George Hinton, who recently inquired about the identification of *Hinton 21048*, hence my restudy of the complex, that I would provide his eponym to the cryptic species IF he would revisit the site and report upon the population concerned, and perhaps obtain

suitable photographs. This he has done, noting that on revisiting Sierra San Jose de los Nuncios in December of 2013, 29 plants were found on the east slope of the Sierras, and 3 on the west slope. "Many were in the shade of Pine and Dasylirion. The largest plant (and the one with the only flower, thanks to the late November rains) was about 30 cm in diameter and about 25 cm high, pictured below with Agave lechuguilla." He also notes in his communication that the plants height as given on the type label is in error. It should have read 0.05 m., not "0.5 m."

Distribution of **M. geohintonii** and its closest morphological cohort, **M. helianthemoides** (in my opinion), is shown in **Map 2.**

ACKNOWLEGEMENTS

My thanks to Nancy Elder, librarian, Univ. of Texas, for bibliographic assistance and to Tim Chumley for discussions relating to his doctoral study of the complex during his studies at Texas. Tom Wendt kindly scanned type material. George Hinton, at my request, kindly re-collected specimens of **M. geohintonii**, along with field photographs; and Jana Kos, my long-time editorial colleague, provided helpful input.

The above paper was written and ready for press, following a diligent search for Chumley's Doctoral Thesis, this reportedly deposited in 2007 in the Univ. of Texas Library, but not to be found; his excellent, detailed, study was subsequently provided to me by my colleague Prof. Beryl Simpson, this from sources other than the library. I was pleasantly surprised to find that Chumley too recognized both of the taxa proposed herein, although not recognizing these as "cryptic" and providing them with different names: *M. henricksonii* var. *henricksonii* (for my **M. chumleyi**) and *M. h.* var. *confusa* (for my **M. geohintonii**, at least in part). I was unaware that these names had been proposed, largely because Chumley had not annotated the sheets concerned as such in the TEX herbarium. Regardless, the present contribution was undertaken without access to his study, and I prefer my formal names over those proposed by him.

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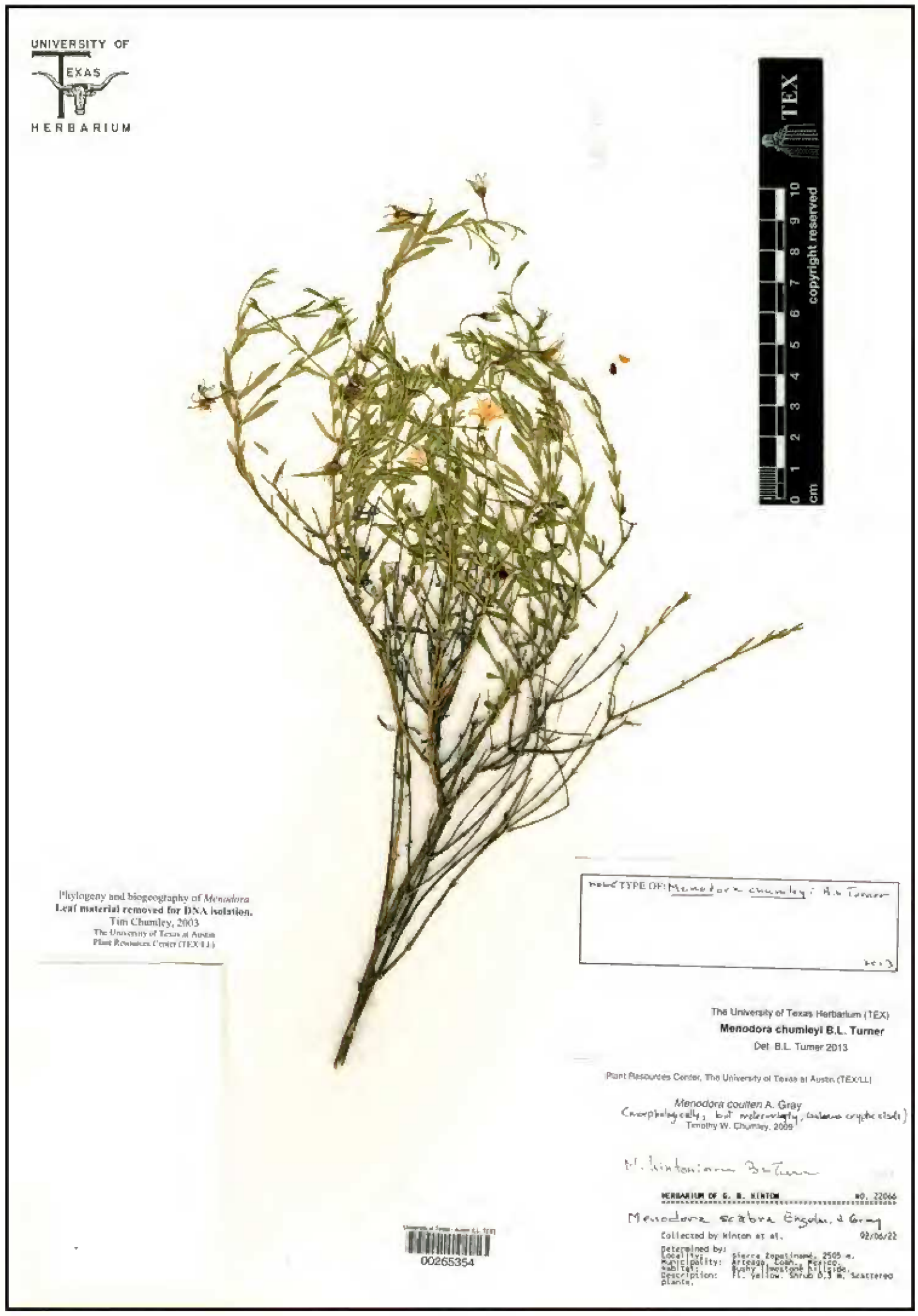

Fig. 1. *Menodora chumleyi* (Holotype: TEX).

Fig. 2. *Menodora geohintonii* (Holotype: TEX).

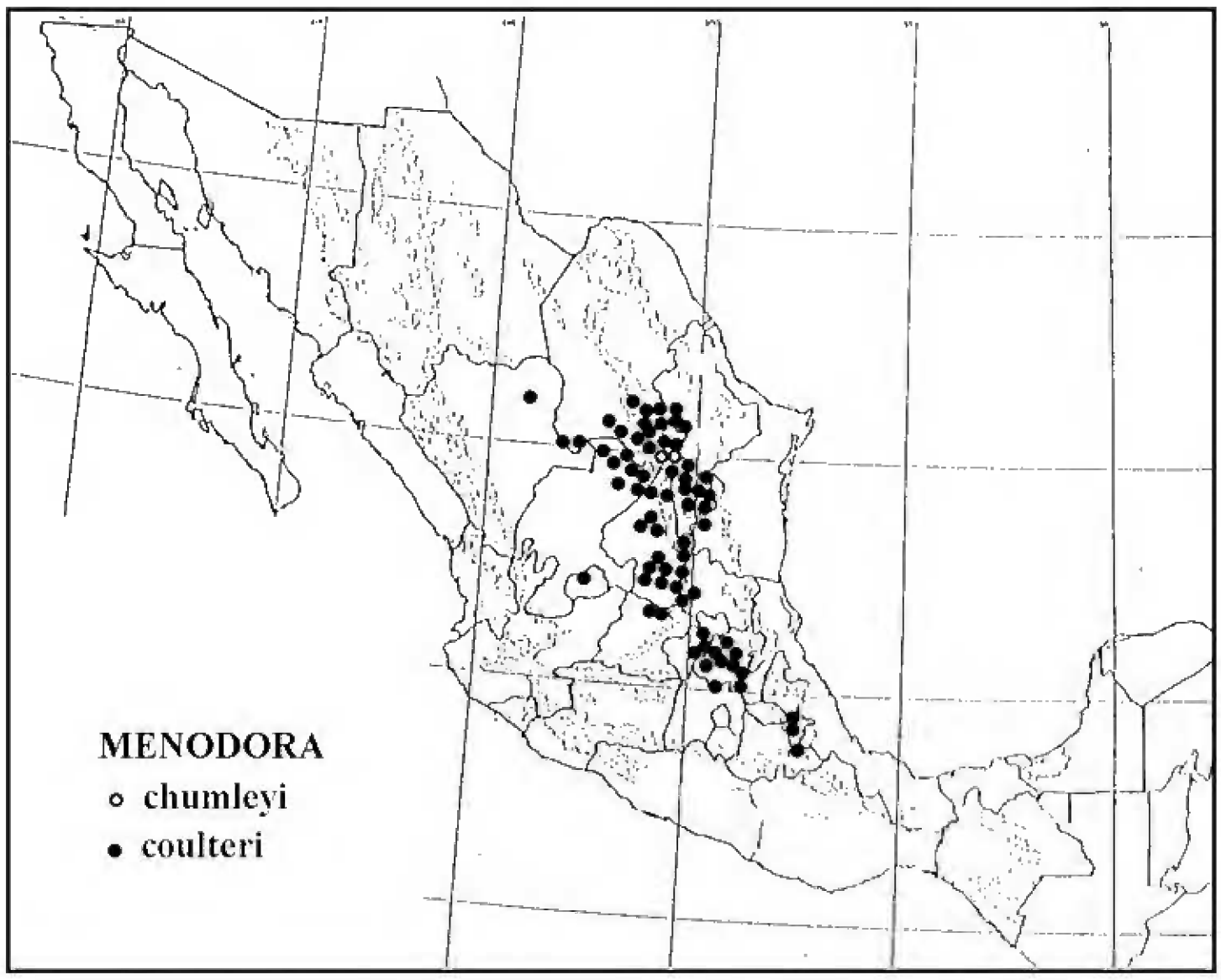

Fig. 3. Distribution of *M. chumleyi* and M. *coulteri.*

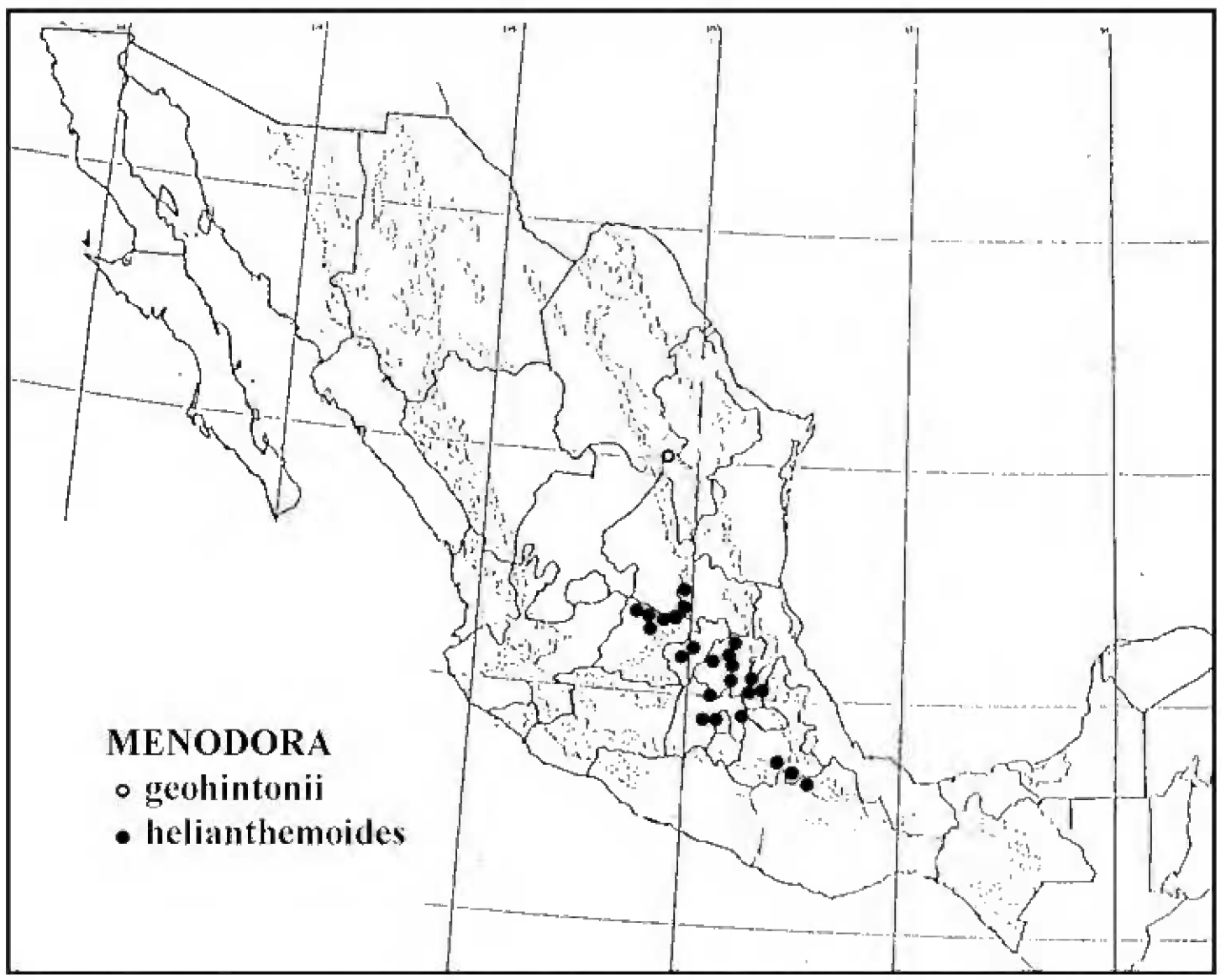

Fig. 4. Distribution of *M. geohintonii* and *M. helianthemoides*.

Fig. 5. *M. geohintonii* at type locality (growing behind *Agave lechugilla*).

Fig. 6. *M. geohintonii* (close-up of flower in Fig. 5).

Fig. 7. Hand-held plant of *M. geohintonii*.

Fig. 8. Type locality, most plants collected near the prominent Yucca in central foreground.

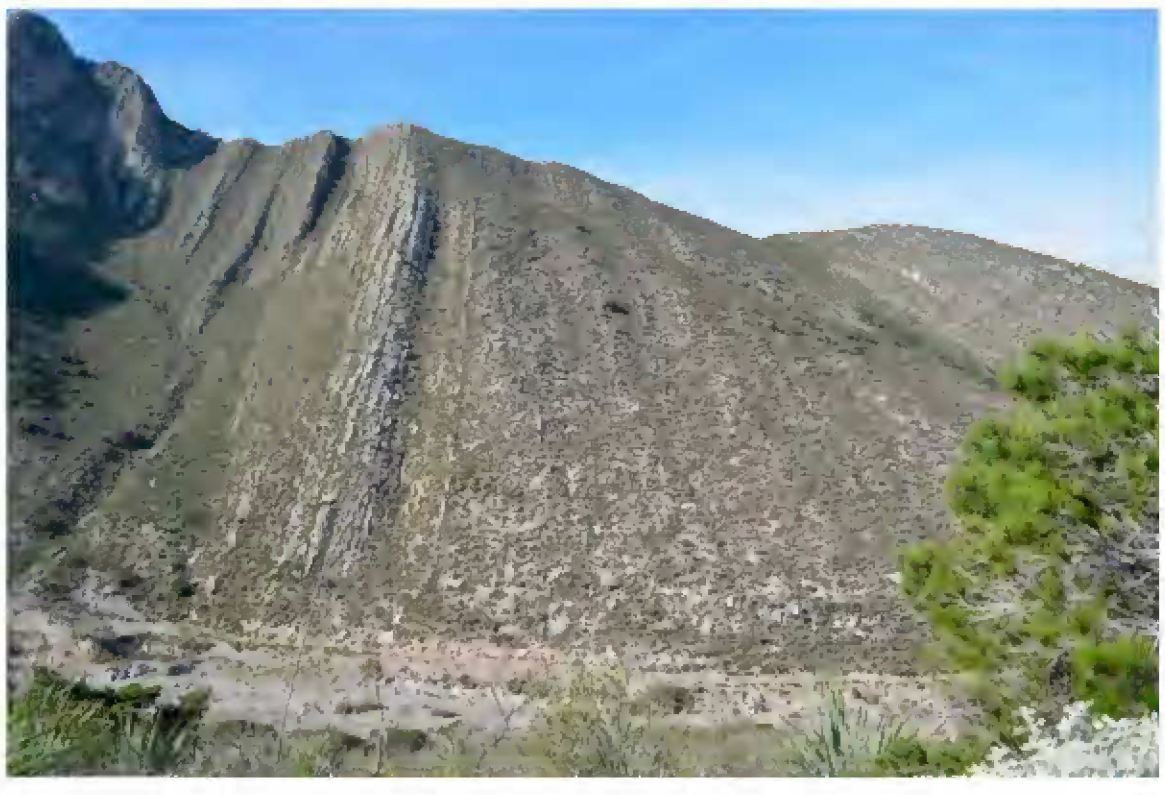

Fig. 9. West side of canyon where a few isolated plants were found.